Asthma control and management in the community

Indices in 1997 compared with indices in 2002

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ABSTRACT

OBJECTIVE To determine whether there was any change in indices of asthma control in population-based samples of patients with asthma between 1997 and 2002.

DESIGN We examined asthma control and treatment in the community using two cross-sectional studies carried out 5 years apart in 1997 and 2002. Pharmacists handed out the questionnaires to patients with asthma; patients completed the questionnaires themselves.

SETTING Community pharmacies in Alberta.

PARTICIPANTS Patients with physician-confirmed asthma attending pharmacies to fill prescriptions for asthma medications.

MAIN OUTCOME MEASURE Asthma control.

RESULTS In 1997 and 2002, 301 and 340 completed questionnaires were received, respectively. Mean age of respondents was 42 and 39 years and the female-to-male ratio was 1.3:1 and 1.4:1, respectively. Overall asthma control was achieved by 27% (1997) and 31% (2002) of subjects, a non-significant change. Regular inhaled corticosteroid use was reported by 63% (1997) and 65% (2002) of subjects; mean daily dose of inhaled corticosteroids reported decreased from 920 µg in 1997 to 765 µg in 2002 ($P<.02$), which might reflect adoption of the newer guideline recommendation for lower-dose inhaled corticosteroids in combination therapy rather than a decrease in severity of asthma. Fewer respondents reported being hospitalized for asthma in 2002 ($P=.02$). Self-management plans were used by 7% and 5% of subjects in 1997 and 2002, respectively.

CONCLUSION In general, asthma control and use of inhaled corticosteroids was similar in 1997 and 2002. There was no evidence that patient education on asthma had increased. Asthma control was poor in 1997 and had not improved by 2002.

EDITOR'S KEY POINTS

- Few other community-based studies have examined changes in asthma control over time outside the artificial environment of clinical trials.
- The authors used data from 1997 and 2002 to investigate whether widespread dissemination of information on asthma management to physicians and patients with asthma had any effect on asthma control.
- The proportion of respondents whose asthma was controlled was similar in 1997 and 2002: 27% and 31%, respectively.
- Fewer patients had been admitted to hospital for asthma during the preceding year in 2002 than in 1997 (11% versus 6%), but more patients had used beta$_2$-agonists to relieve symptoms more than once a day in 2002 (36% versus 44%).

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Contrôle et traitement extra-hospitaliers de l'asthme

Comparaison des indices de 1997 et de 2002

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RÉSUMÉ

OBJECTIF Vérifier si les indices de contrôle de l'asthme ont changé entre 1997 et 2002 chez des échantillons basé à population de patients asthmatiques.

TYPE D'ÉTUDE Le contrôle et le traitement extra-hospitaliers de l'asthme ont été évalués à partir de deux études transversales effectuées à 5 ans d'intervalle, soit en 1997 et 2002. Les questionnaires ont été distribués aux patients asthmatiques par les pharmaciens; les patients les ont complétés eux-mêmes.

CONTEXTE Pharmacies extra-hospitalières de l'Alberta.

PARTICIPANTS Patients avec un diagnostic médical d'asthme et recevant leur médication anti-asthmatique d'une pharmacie.

PRINCIPAL PARAMÈTRE À L'ÉTUDE Contrôle de l'asthme.

RÉSULTATS Le nombre de réponses reçues s'élevait à 301 et 340 respectivement pour 1997 et 2002; pour ces mêmes années, les répondants avaient en moyenne 42 et 39 ans, et les rapports femme-homme étaient de 1,3/1 et de 1,4/1. Un contrôle global de l'asthme a été obtenu chez 27% (1997) et 31% (2002) des sujets, un changement non significatif. Une utilisation régulière de corticostéroïdes en inhalation a été rapportée par 63% (1997) et 65% (2002) des patients; la dose moyenne de corticostéroïdes en inhalation a diminué de 920 µg en 1997 à 765 µg en 2002 (P <0,02), ce qui pourrait refléter l'adoption des plus récentes directives de pratique qui recommandent des doses plus faibles de corticostéroïdes en inhalation en traitement combiné plutôt qu'une baisse de sévérité de l'asthme. Moins de répondants ont déclaré avoir été hospitalisés en 2002 (P = 0,02). Des plans d'auto-traitement ont été utilisés par 7% et 5% des patients respectivement en 1997 et 2002

CONCLUSION En général, le contrôle de l'asthme et l'utilisation des corticostéroïdes en inhalation ont été semblables en 1997 et en 2002. Rien n'indique que les patients en savaient davantage sur leur maladie. Le contrôle de l'asthme n'était pas très bon en 1997 et il n'était pas meilleur en 2002.

POINTS DE REPÈRE DU RÉDACTEUR

- Peu d'études extra-hospitalières ont examiné l'évolution dans le temps du contrôle de l'asthme, sauf dans le contexte artificiel d'essais cliniques.
- Dans cette étude, on s'est servi de données de 1997 et 2002 pour déterminer si répandu diffusion d'information aux médecins et aux patients sur le traitement de l'asthme a eu une influence quelconque sur le contrôle de l'asthme.
- La proportion de répondants dont l'asthme était sous contrôle était sensiblement la même en 1997 et 2002, soit 27% et 31% respectivement.
- Moins de patients avaient été hospitalisés pour asthme dans l'année précédant 2002 par rapport à 1997 (11% versus 6%), mais plus de patients avaient utilisé des agonistes bèta$_2$ plus d'une fois par jour pour soulager leur symptômes en 2002 (36% versus 44%).

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Asthma control has been the focus of several iterations of Canadian asthma consensus documents and patient surveys.[1-3] At least one study has examined the feasibility of control as proposed by asthma guidelines,[4] and a more recent study has confirmed that asthma control is a feasible outcome and is associated with marked improvement in quality of life and a substantial reduction in morbidity.[5]

In 1997, we surveyed asthma patients in Alberta and found that, notwithstanding an intensive program of asthma education in various communities, there was no measurable increase in asthma control.[6] In 2002, we repeated the study using the same methods and targeting patients with asthma who were currently receiving treatment. A study of Finnish military recruits had examined the changing prevalence of asthma and noted incidentally that, during the 15-year period up to 2003, there had been either an improvement in control or a reduction in disease severity in that population.[7] No other community-based study has examined changes in asthma control over time outside the artificial environment of a clinical trial. We used data from 1997 and 2002 to investigate whether widespread dissemination of information on asthma management to physicians and to patients with asthma had any effect on disease control.

METHODS

Community pharmacists were invited to participate in the study. Those who agreed were provided with a supply of questionnaires and asked to give them to patients with a doctor's diagnosis of asthma who came to the pharmacies to fill prescriptions for asthma medications. The questionnaire has been used in our centre to assess more than 3000 patients with asthma.[8] Data obtained from responses to the questionnaires appear to correlate well with other findings related to asthma severity and control.[8] The questions we asked included direct questions about asthma control and other questions on patients' medication use, including their use of inhaled and oral corticosteroids; asthma monitoring; use of action plans; hospital admissions; and exposure to asthma triggers. Pharmacists were paid a small fee for each completed questionnaire. The 1997 survey included pharmacies in 3 small urban communities; the 2002 study included pharmacies in large and small urban communities. The definition of asthma control was identical in both studies (**Table 1**).

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Table 1. Definition of asthma control

Patients have good control if they have done *none* of the following.
• Used beta$_2$-agonists to relieve symptoms more than once a day
• Woken at night with asthma in the last week
• Sought emergency treatment for asthma in the last year
• Missed work or school due to asthma in the last 3 months

Chi-square analysis was applied to categorical data and the Student *t* test to continuous data using Epi Info, version 6 (Centres for Disease Control in Atlanta, Ga, and the World Health Organization in Geneva, Switz). We restricted the survey to a 6-month period and calculated that we would need at least 288 completed questionnaires in each survey to show a 10% improvement in asthma control with 95% confidence and a power of 80%.

The study was approved by the Conjoint Health Research Ethics Board of the University of Calgary and the Health Research Ethics Board of the University of Alberta.

RESULTS

In 1997, 301 completed questionnaires were received, and in 2002, 340 were received. Mean age of respondents was 42 years and 39 years and the female-to-male ratio was 1.25:1 and 1.37:1 in 1997 and 2002, respectively. The proportion of respondents whose asthma was controlled was similar: 27% in 1997 and 31% in 2002 (**Table 2**). Fewer patients had had to be admitted to

Table 2. Components of asthma control in 1997 and 2002: *Use of short-acting beta$_2$-agonists to relieve asthma symptoms had increased and the rate of hospitalization for asthma had decreased in the 2002 survey.*

COMPONENTS	1997 N = 301 N (%)	2002 N = 340 N (%)	*P* VALUE
Admissions for asthma in the last 12 mo*	33 (11.0)	20 (5.9)	.02
Emergency visits for asthma in the last 12 mo	92 (30.6)	95 (27.9)	.5
Waking at night with asthma in the last week	149 (49.5)	148 (43.5)	.1
Using beta$_2$-agonists more than once a day	107 (35.6)	149 (43.8)	.03
Missing work or school due to asthma in the last 3 mo	38 (12.6)	38 (11.2)	.6

*One subject in the 1997 survey had been admitted to hospital without treatment in an emergency department, but fulfilled the definition of poor control on the basis of the 3 other criteria.

hospital for asthma during the preceding year (11% versus 6%, $P=.02$), and more patients had had to use beta$_2$-agonists to relieve symptoms more than once a day (36% versus 44%, $P=.03$) in 2002 than in 1997. No other significant differences in disease control were noted.

Although the proportion of patients who listed inhaled corticosteroids among their asthma medications had increased from 75% to 85% ($P=.002$) in the 5 years between the surveys, there was no difference in the proportion who listed regular use of inhaled corticosteroids (63% and 65%, respectively). Mean daily dose of inhaled corticosteroids (beclomethasone equivalent) had decreased from 920 µg (standard deviation [SD] 651 µg) in 1997 to 765 µg (SD 582 µg) in 2002 ($P<.02$).

Patients listing inhaled corticosteroids among their medications were less likely to have control of their asthma in 1997, but in 2002, there was no relationship between control and reported use of inhaled corticosteroids. Use of long-acting beta$_2$-agonists and leukotriene-receptor antagonists (LTRAs) was uncommon in 1997, and specific questions about their use were not included in the 1997 questionnaire. Long-acting beta$_2$-agonists were used by 36% and LTRAs by 15% of respondents in the 2002 study.

Only 11% of subjects in each sample had self-management plans, and 7% and 5% of subjects in 1997 and 2002, respectively, indicated that they had ever used these plans. A similar proportion of subjects in each survey (15% and 17%) monitored their asthma, but did not have self-management plans to guide them in using what they learned from monitoring. A similar proportion of respondents smoked, 19% and 20% in 1997 and 2002, respectively, and in both surveys, a total of 35% smoked or were exposed to smoke at home. Animals in the home were reported by 54% and 56% of subjects in 1997 and 2002, respectively.

DISCUSSION

We conducted 2 similar cross-sectional studies separated by 5 years to assess asthma management and control in community samples. Findings from pharmacy-based self-completion questionnaires showed that the situation in Alberta was similar to situations described in results of Canadian random telephone-dialing surveys.[3,9]

The similarity of the results of our 2 surveys is surprising. The 5-year period between the surveys was characterized by intensive asthma publicity aimed at physicians and the public. During that 5-year period, asthma education became established with development of national certification of asthma educators and asthma education programs throughout the country.[10] The 1999 national asthma consensus document[2] was released and was associated with an intensive endeavour to disseminate the information and bring about appropriate changes in physicians' practice.

In Alberta, the Alberta Strategy To Help Manage Asthma (ASTHMA) involved a large sample of family physicians in a survey of asthma patients' records.[11] On the pharmaceutical front, new developments included widespread acceptance of the concept of add-on therapy, notably of long-acting beta$_2$-agonist therapy, which, with inhaled corticosteroids, had been shown to greatly enhance asthma control and patients' quality of life.[5,12-14] This report and another also conducted in Alberta[6] and national surveys[3,15] have shown that there is substantial resistance to accepting good control as the desired end point in treatment of asthma. Resistance does not appear to be based on reluctance to prescribe appropriate medications for asthma: the 2002 component of this study shows that a remarkable 85% of patients had prescriptions for inhaled corticosteroids, which are the core of asthma management. Even the newer medications appear to have been appropriately prescribed: long-acting beta$_2$-agonists were listed by 36% of subjects and leukotriene-receptor antagonists by 15% of subjects in the 2002 survey.

The reduction in daily mean dose of inhaled corticosteroids between the 2 surveys probably reflects increased use of add-on therapy, notably long-acting beta$_2$-agonists, rather than a reduction in the severity of asthma. On the other hand, despite many patients' failure to comply with asthma medications,[16] there is no evidence that attempts are being made to provide patients with behaviour-modifying, disease-specific education. This is reflected by the fact that there was no change in use of self-management plans, which are a useful index of effective patient education.[17] In part, this finding might reflect the considerable cost to family physicians associated with implementing the education and follow-up recommendations of the Canadian asthma consensus document.[18]

Limitations

The weakness of our study relates to factors that determined whether pharmacists agreed to have the questionnaires, whether they offered clients the questionnaires, and whether subjects agreed to complete the questionnaires. We had no control over these activities, and it is conceivable that questionnaires were offered only to subjects who visited pharmacies frequently and whose asthma was poorly controlled. If such biases existed, they were likely to have been similar in both surveys, given that the methodology and incentives (frequent reminders and a small administrative fee) were similar. We believe, therefore, that comparing these 2 identically performed surveys is valid, even though both might have some undefined bias. The validity of our data is supported also by the similarity between our results and those of other community-based national surveys.[3,9]

Conclusion

There was little overall change in asthma control in the community samples examined in 1997 and 2002. Between 1997 and 2002, new asthma consensus guidelines that reinforced the messages of earlier guidelines had been published and disseminated.[2] Add-on therapy (long-acting beta$_2$-agonists and leukotriene-receptor antagonists) became widely available, and its use was encouraged by the new (1999) guidelines.[2] There was no evidence that more patients were using asthma self-management plans, which suggested that asthma education had not been widely carried out. The overall rate of asthma control in these community-based subjects was poor and did not improve during the 5 years between the surveys.

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Contributors

Dr Cowie, *principal investigator, designed the study, analyzed the data, and wrote the manuscript.* **Ms Underwood** *participated in designing the study, was responsible for distributing and collecting the questionnaires, assisted with data entry, and contributed to writing the manuscript.* **Dr Sin** *participated in designing the 2002 component of the study and in developing the manuscript.* **Ms Sharpe** *participated in designing the study, helped with distributing and collecting the questionnaires for the 2002 component of the study, and reviewed the manuscript.* **Dr Bell** *participated in designing the study and provided a detailed revision of the manuscript.* **Dr Man** *participated in designing the 2002 component of the study and assisted with developing the manuscript.*

Competing interests

None declared

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